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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,633	11/14/2000	Ramarathnam Venkatesan	MS1-650US	3022

22801 7590 06/29/2005

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EXAMINER

YIGDALL, MICHAEL J

ART UNIT	PAPER NUMBER
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2192

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/713,633

Applicant(s)

VENKATESAN ET AL.

Examiner

Michael J. Yigdall

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-15 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-15 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 12, 2005 has been entered. Claims 1-4, 6-15 and 18-22 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 9, 11, 18 and 21 have been fully considered but they are not persuasive.

Applicant contends that Hsu does not disclose the concept of an "augmented local neighborhood" and that Hsu does not disclose expanding the operational neighborhood to include a "block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block" (Applicant's remarks, page 18, paragraph at line 21; page 28, paragraph at line 22; and page 31, paragraph at line 11).

However, Hsu discloses operating on the immediate neighbors of an object in the graph (see, for example, step 128 in FIG. 8 and column 13, lines 60-63), as acknowledged by Applicant. The immediate neighbors of an object constitute the local neighborhood of that object. Hsu further discloses subsequently operating on subgraphs of the graph (see, for example, step 150 in FIG. 10 and column 15, lines 46-50). The subgraphs comprise groups of exact matching objects that are connected together in the graph (see, for example, step 140 in

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FIG. 10 and column 14, lines 46-50 and 59-64), and groups of non-exact matching objects (see, for example, step 142 in FIG. 10 and column 15, lines 9-13). Thus, the subgraphs include the local neighborhood of an object plus other surrounding objects, including exact matching objects and non-exact matching objects. A subgraph, therefore, constitutes an augmented local neighborhood as recited in the claim.

Applicant contends that the combination of Schweitz and Hsu does not disclose “computing labels for each block ... based upon content of a block” (Applicant’s remarks, page 22, paragraph at line 1), and that Schweitz cannot disclose “forming a ‘d-label’ for each block in a neighborhood based upon labels of the blocks within the neighborhood” because Schweitz does not disclose neighborhoods (Applicant’s remarks, page 22, paragraph at line 4).

However, Hsu discloses computing an object ID or label for each object (see, for example, column 11, lines 23-27). Hsu discloses that the object ID is based on the type of object (see, for example, column 12, line 66 to column 13, line 4), which is to say that that the object ID is based on content of the object. The object ID constitutes a label. Hsu further discloses forming a score for each block in each neighborhood according to the object type or object ID (see, for example, column 13, lines 60-67). The score constitutes a “d-label.” Thus, Hsu discloses computing labels for each block based upon content of a block and forming a “d-label” for each block in a neighborhood based upon those labels.

Applicant contends that Hsu does not disclose a “procedure-match-criterion [that] represents the number of matching blocks between [two procedures being compared]” (Applicant’s remarks, page 23, paragraph at line 17).

However, Hsu discloses computing a score that represents the degree of matching between objects of the first and second programs (see, for example, column 9, lines 32-36). Hsu further discloses that the scores are stored in a matrix and resolved so as to represent the number of matching objects (see, for example, column 13, lines 22-40). Thus, Hsu discloses a score or criterion that represents the number of matching objects. Schweitz discloses comparing the content and lengths of functions or procedures to determine the number of matching nodes (see, for example, column 9, lines 5-8). Schweitz in view of Hsu, therefore, disclose a procedure-match-criterion that represents the number of matching blocks between the procedures.

3. Applicant's arguments with respect to claims 8 and 13 have been considered but are moot in view of the new ground(s) of rejection, as set forth below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6, 7, 11, 12 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,594,822 to Schweitz et al. (art of record, "Schweitz") in view of U.S. Pat. No. 5,974,254 to Hsu (art of record, "Hsu").

With respect to claim 1 (currently amended), Schweitz discloses a method for generating a delta between a first program binary and a second program binary (see, for example, the abstract), the method comprising the steps of:

(a) obtaining a first control flow graph (CFG) representation of the first binary and obtaining a second CFG representation of the second binary (see, for example, graphs 150 and 155 in FIG. 2);

(b) comparing the first and second CFG representations to identify blocks (nominally matched blocks) that match in the first and second CFG representations, thereby identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see, for example, column 4, lines 28-29).

Although Schweitz discloses comparing the content of the blocks (see, for example, FIG. 3C), Schweitz does not expressly disclose the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block, an augmented local neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see, for example, the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and second graph representations (see, for example, column 4, lines 46-56) and

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matching or comparing the graphs to identify similarities and differences (see, for example, column 4, line 57 to column 5, line 6). Hsu further discloses operating on the immediate neighbors of an object in the graph (see, for example, step 128 in FIG. 8 and column 13, lines 60-63), or in other words on the local neighborhood of an object. Hsu further discloses subsequently operating on subgraphs of the graph (see, for example, step 150 in FIG. 10 and column 15, lines 46-50), which comprise groups of exact matching objects that are connected together in the graph (see, for example, step 140 in FIG. 10 and column 14, lines 46-50 and 59-64), and groups of non-exact matching objects (see, for example, step 142 in FIG. 10 and column 15, lines 9-13). Thus, the subgraphs include the local neighborhood of an object plus other surrounding objects, including exact matching objects and non-exact matching objects.

Therefore, the subgraphs of Hsu are considered augmented local neighborhoods.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see, for example, Schweitz, the abstract) to address the differences found between two graphical programs (see, for example, Hsu, the abstract).

Therefore, Schweitz in view of Hsu discloses the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger

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neighborhood of blocks surrounding that block, an augmented local neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses the steps of:

(c) determining edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see, for example, Schweitz, column 4, lines 29-32);

(d) producing a delta comprising the unmatched blocks and the edit-operations (see, for example, Schweitz, column 4, lines 11-15).

With respect to claim 2 (original), Schweitz in view of Hsu further discloses a method for transmitting a delta (see, for example, Schweitz, column 1, lines 58-60) comprising:

(a) a method for generating a delta as recited in claim 1 (see the rejection of claim 1 above);

(b) transmitting the delta over a network (see, for example, Schweitz, column 1, lines 58-60).

With respect to claim 3 (original), Schweitz in view of Hsu further discloses a method for patching a copy of the first program binary (see, for example, Schweitz, abstract), the method comprising:

(a) a method for generating a delta as recited in claim 1 (see the rejection of claim 1 above);

(b) patching the copy of the first program binary so that the copy is substantially identical to the second program binary, wherein the delta guides such patching (see, for example, Schweitz, column 1, lines 25-28).

With respect to claim 4 (previously presented), Schweitz in view of Hsu further discloses a method as recited in claim 1, wherein a local neighborhood of a particular block consists of those blocks immediately adjacent that block (see, for example, Hsu, column 13, lines 60-63, which shows that a local neighborhood consists of immediate neighbors).

With respect to claim 6 (original), Schweitz in view of Hsu further discloses a computer-readable medium having embodied thereon a data structure, comprising a delta generated in accordance with the steps recited in claim 1 (see, for example, Schweitz, column 10, lines 3-6, and see the rejection of claim 1 above).

With respect to claim 7 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 1 (see, for example, Schweitz, column 9, lines 54-55, and see the rejection of claim 1 above).

With respect to claim 11 (previously presented), Schweitz discloses a method for matching procedures between a first control flow graph (CFG) representation of a portion of a first program and a second CFG representation of a portion of a second program (see, for example, the abstract, and graphs 150 and 155 in FIG. 2), wherein a procedure comprises

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multiple blocks in a CFG representation (see, for example, column 5, lines 58-62, which shows that a function or procedure comprises multiple nodes or blocks in a graph representation).

Although Schweitz discloses comparing the content and lengths of functions or procedures to determine the number of matching nodes or blocks (see, for example, column 9, lines 5-8), Schweitz does not expressly disclose:

(a) computing a procedure-match-criterion for a procedure in the second CFG representation, where the procedure-match-criterion for a procedure in the second CFG representation represents the number of matching blocks between that procedure and a specified procedure in the first CFG representation;

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see, for example, column 4, line 46 to column 5, line 6). Hsu further discloses computing a score that represents the degree of matching between objects of the first and second programs (see, for example, column 9, lines 32-36). Hsu further discloses that the scores are stored in a matrix and resolved so as to represent the number of matching objects (see, for example, column 13, lines 22-40). Thus, Hsu discloses a score or criterion that represents the number of matching objects.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the match criterion features taught by Hsu, for the purpose of creating a software patch (see, for example, Schweitz, the abstract) to address the differences found between two graphical programs (see, for example, Hsu, the abstract).

Therefore, Schweitz in view of Hsu discloses computing a procedure-match-criterion for a procedure in the second CFG representation, where the procedure-match-criterion for a

procedure in the second CFG representation represents the number of matching blocks between that procedure and a specified procedure in the first CFG representation.

Schweitz in view of Hsu further discloses the step of:

(b) matching procedures in the second CFG representation with the specified procedure in the first CFG representation based upon the procedure-match-criteria for the procedures in the second CFG representation (see, for example, Schweitz, FIG. 3C).

With respect to claim 12 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 11 (see, for example, Schweitz, column 9, lines 54-55, and see the rejection of claim 11 above).

With respect to claim 18 (currently amended), Schweitz discloses a patch data structure (see, for example, the abstract) generated in accordance with the following acts:

(a) providing a server computer in a communications with a communications network (see, for example, column 1, lines 58-60, noting that a server computer is inherently provided to deliver a patch through a communications network);

(b) receiving input from a client computer by way of the communications network, the input providing a parameter indicative of a request for upgrading a copy of a first program binary to a match a second program binary (see, for example, column 1, lines 25-28 and 53-60, noting that input is inherently received to deliver a patch through a communications network);

(c) retrieving a delta between a first program binary and the second program binary (see, for example, column 4, lines 11-15), wherein computing such delta comprises the steps of:

(i) obtaining a first control flow graph (CFG) representation of the first binary and obtaining a second CFG representation of the second binary (see, for example, graphs 150 and 155 in FIG. 2);

(ii) comparing the first and second CFG representations to identify blocks (nominally matched blocks) that match in the first and second CFG representations, thereby identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see, for example, column 4, lines 28-29).

Although Schweitz discloses comparing the content of the blocks (see, for example, FIG. 3C), Schweitz does not expressly disclose the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block, an augmented local neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see, for example, the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and second graph representations (see, for example, column 4, lines 46-56) and matching or comparing the graphs to identify similarities and differences (see, for example, column 4, line 57 to column 5, line 6). Hsu further discloses operating

on the immediate neighbors of an object in the graph (see, for example, step 128 in FIG. 8 and column 13, lines 60-63), or in other words on the local neighborhood of an object. Hsu further discloses subsequently operating on subgraphs of the graph (see, for example, step 150 in FIG. 10 and column 15, lines 46-50), which comprise groups of exact matching objects that are connected together in the graph (see, for example, step 140 in FIG. 10 and column 14, lines 46-50 and 59-64), and groups of non-exact matching objects (see, for example, step 142 in FIG. 10 and column 15, lines 9-13). Thus, the subgraphs include the local neighborhood of an object plus other surrounding objects, including exact matching objects and non-exact matching objects. Therefore, the subgraphs of Hsu are considered augmented local neighborhoods.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see, for example, Schweitz, the abstract) to address the differences found between two graphical programs (see, for example, Hsu, the abstract).

Therefore, Schweitz in view of Hsu discloses the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block, an augmented local

neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses the steps of:

(iii) determining edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see, for example, Schweitz, column 4, lines 29-32);

(iv) producing a delta comprising the unmatched blocks and the edit-operations (see, for example, Schweitz, column 4, lines 11-15);

(d) generating the patch data structure as a function of the delta (see, for example, Schweitz, column 4, lines 29-32).

With respect to claim 19 (original), Schweitz in view of Hsu further discloses a method for transmitting a patch data structure comprising transmitting a patch data structure as recited in claim 18 over a communications network (see, for example, Schweitz, column 1, lines 58-60, and see the rejection of claim 18 above).

With respect to claim 20 (original), Schweitz in view of Hsu further discloses a method for patching a copy of the first program binary at a client computer (see Schweitz, abstract), the method comprising patching the copy of the first program binary so that the copy is substantially identical to the second program binary, wherein a delta in a patch data structure as recited in claim 18 guides such patching (see, for example, Schweitz, column 1, lines 25-28, and see the rejection of claim 18 above).

With respect to claim 21 (currently amended), Schweitz discloses a delta-generator system (see, for example, the abstract), comprising:

(a) a comparator that is configured to compare a first control flow graph (CFG) representation of a first program binary and a second CFG representation of the second program binary for identifying blocks (nominally matched blocks) that match in the first and second CFG representations, thereby identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see, for example, graphs 150 and 155 in FIG. 2, and column 4, lines 28-29).

Although Schweitz discloses comparing the content of the blocks (see, for example, FIG. 3C), Schweitz does not expressly disclose the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block, an augmented local neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see, for example, the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and second graph representations (see, for example, column 4, lines 46-56) and matching or comparing the graphs to identify similarities and differences (see, for example, column 4, line 57 to column 5, line 6). Hsu further discloses operating on the immediate

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neighbors of an object in the graph (see, for example, step 128 in FIG. 8 and column 13, lines 60-63), or in other words on the local neighborhood of an object. Hsu further discloses subsequently operating on subgraphs of the graph (see, for example, step 150 in FIG. 10 and column 15, lines 46-50), which comprise groups of exact matching objects that are connected together in the graph (see, for example, step 140 in FIG. 10 and column 14, lines 46-50 and 59-64), and groups of non-exact matching objects (see, for example, step 142 in FIG. 10 and column 15, lines 9-13). Thus, the subgraphs include the local neighborhood of an object plus other surrounding objects, including exact matching objects and non-exact matching objects. Therefore, the subgraphs of Hsu are considered augmented local neighborhoods.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see, for example, Schweitz, the abstract) to address the differences found between two graphical programs (see, for example, Hsu, the abstract).

Therefore, Schweitz in view of Hsu discloses the limitation wherein the comparing is based upon content of blocks being compared and augmented local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation, and an augmented local neighborhood of that particular block consists that block's local neighborhood plus a random sampling of blocks from a substantially larger neighborhood of blocks surrounding that block, an augmented local neighborhood in a CFG representation consisting of less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses:

(b) an edit-op determiner configured to determine the edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see, for example, Schweitz, column 4, lines 29-32);

(c) an output sub-system that is configured to produce a delta comprising the unmatched blocks and the edit-operations (see, for example, Schweitz, column 4, lines 11-15).

With respect to claim 22 (original), Schweitz in view of Hsu further discloses a computer-readable medium having embodied thereon a data structure comprising a delta produced by the system as recited in claim 21 (see, for example, Schweitz, column 10, lines 3-6, and see the rejection of claim 21 above).

6. Claims 8-10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schweitz in view of Hsu in view of U.S. Pat. No. 6,205,444 to Floratos et al. (art made of record, "Floratos").

With respect to claim 8 (original), Schweitz discloses a method for matching blocks between a first control flow graph (CFG) representation of a portion of a first program and a second CFG representation of a portion of a second program (see, for example, the abstract and graphs 150 and 155 in FIG. 2), the method comprising:

(a) matching blocks between the first and second CFG representations based upon the content of the blocks (see, for example, FIG. 3C);

(b) detecting outliers, wherein outliers are blocks in the first CFG representation that do not match any block in the second CFG representation during the matching step (see, for example, column 4, lines 29-32).

Schweitz does not expressly disclose the step of:

(c) computing a neighborhood of each block in the first and second CFG representation by performing a breadth first traversal.

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see, for example, column 4, line 46 to column 5, line 6). Hsu further discloses traversing the graphs (see, for example, column 14, lines 65-67) and examining the neighborhoods in the graphs (see, for example, step 128 in FIG. 8 and column 13, lines 60-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the neighborhood features taught by Hsu, for the purpose of creating a software patch (see, for example, Schweitz, abstract) to address the differences found between two graphical programs (see, for example, Hsu, abstract).

Although Hsu is silent as to the method of traversal, a breadth first search or traversal is well known in the art. Floratos, for example, discloses that breadth first searches are well known and well documented in the art for systematically exploring the edges of a graph to discover every reachable vertex from a source vertex (see, for example, column 7, lines 53-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the traversal of Hsu be performed as a breadth first traversal, as is well known in

the art and as taught by Floratos, for the purpose of systematically exploring the edges of the graph to compute the neighborhood of each block.

Therefore, Schweitz in view of Hsu in view of Floratos discloses computing a neighborhood of each block in the first and second CFG representation by performing a breadth first traversal.

Schweitz in view of Hsu in view of Floratos further discloses the step of:

(d) removing the outliers from each neighborhood (see, for example, Schweitz, column 1, lines 25-28 and column 4, lines 29-32).

With respect to claim 9 (currently amended), Schweitz in view of Hsu in view of Floratos further discloses:

(a) computing labels for each block in first and second CFG representations based upon content of a block (see, for example, Hsu, column 11, lines 23-27, which shows computing an object ID or label for each object or block, and column 12, line 66 to column 13, line 4, which shows that the object ID or label is based on the type or content of the object or block);

(b) for each neighborhood computed in the computing step, forming a “d-label” for each block in a neighborhood based upon labels of the blocks within the neighborhood (see, for example, Hsu, column 13, lines 60-67, which shows forming a score or “d-label” for each block in each neighborhood according to the object type or object ID or label);

(c) attempting to match blocks between first and second CFG representations by comparing the d-labels of the blocks (see, for example, Hsu, column 9, lines 32-36, which shows matching the blocks by comparing scores or “d-labels”).

With respect to claim 10 (original), Schweitz in view of Hsu in view of Floratos further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 8 (see, for example, Schweitz, column 9, lines 54-55, and see the rejection of claim 8 above).

With respect to claim 13 (currently amended), Schweitz discloses a method for matching of blocks in a procedure of a first control flow graph (CFG) representation of a portion of a first program between an ostensibly matching procedure of second CFG representation of a portion of second program (see, for example, the abstract and graphs 150 and 155 in FIG. 2), the method comprising:

(a) matching blocks between the first and second CFG representations based upon the content of the blocks (see, for example, FIG. 3C);

Schweitz does not expressly disclose the step of:

(b) computing successively smaller neighborhoods of each block in the first and second CFG representations via breadth first traversals.

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see, for example, column 4, line 46 to column 5, line 6). Hsu further discloses traversing the graphs (see, for example, column 14, lines 65-67) and examining the neighborhoods in the graphs (see, for example, step 128 in FIG. 8 and column 13, lines 60-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the neighborhood features taught by Hsu,

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for the purpose of creating a software patch (see, for example, Schweitz, abstract) to address the differences found between two graphical programs (see, for example, Hsu, abstract).

Although Hsu is silent as to the method of traversal, a breadth first search or traversal is well known in the art. Floratos, for example, discloses that breadth first searches are well known and well documented in the art for systematically exploring the edges of a graph to discover every reachable vertex from a source vertex (see, for example, column 7, lines 53-67). Floratos further discloses performing a breadth first search to prune a graph of “infeasible” objects (see, for example, column 8, lines 1-7 and line 66 to column 9, line 6), so as to remove objects that would otherwise preclude finding the best matches among a plurality of sequences (see, for example, column 4, lines 21-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the traversal of Hsu be performed as a breadth first traversal, as is well known in the art and as taught by Floratos, for the purpose of systematically exploring the edges of the graph to compute the neighborhood of each block. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to prune the neighborhoods of Hsu, such as taught by Floratos, so as to remove objects or blocks in the graphs that would otherwise prevent matching the blocks. Pruning a neighborhood would result in a successively smaller neighborhood.

Therefore, Schweitz in view of Hsu in view of Floratos discloses computing successively smaller neighborhoods of each block in the first and second CFG representations via breadth first traversals.

Schweitz in view of Hsu in view of Floratos further discloses the step of:

(c) for each neighborhood computed in the computing step, forming a “d-label” for each block in a neighborhood based upon labels of the blocks within the neighborhood (see, for example, Hsu, column 13, lines 60-67, which shows forming a score or “d-label” for each block in each neighborhood according to the object type or object ID or label);

(d) attempting to match blocks between first and second CFG representations by comparing the d-labels of the blocks (see, for example, Hsu, column 9, lines 32-36, which shows matching the blocks by comparing scores or “d-labels”).

With respect to claim 14 (original), Schweitz in view of Hsu in view of Floratos further discloses the limitation wherein at least one neighborhood computed in the computing steps is augmented with a random sampling of blocks in the complete representation of the neighborhood (see, for example, Hsu, steps 140 and 142 in FIG. 10, column 14, lines 46-50 and 59-64, and column 15, lines 9-13, which shows augmenting a neighborhood with blocks to form a subgraph).

With respect to claim 15 (original), Schweitz in view of Hsu in view of Floratos further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 13 (see, for example, Schweitz, column 9, lines 54-55, and see the rejection of claim 13 above).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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